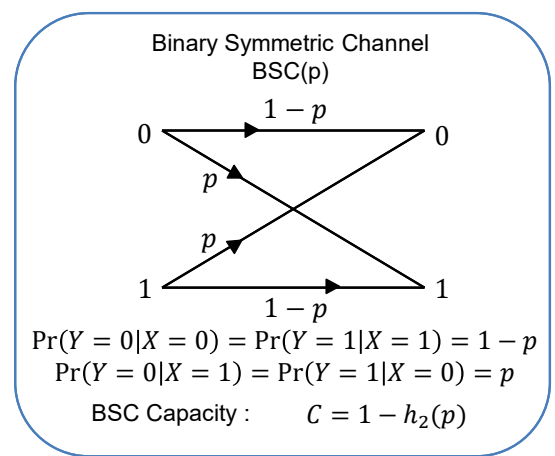
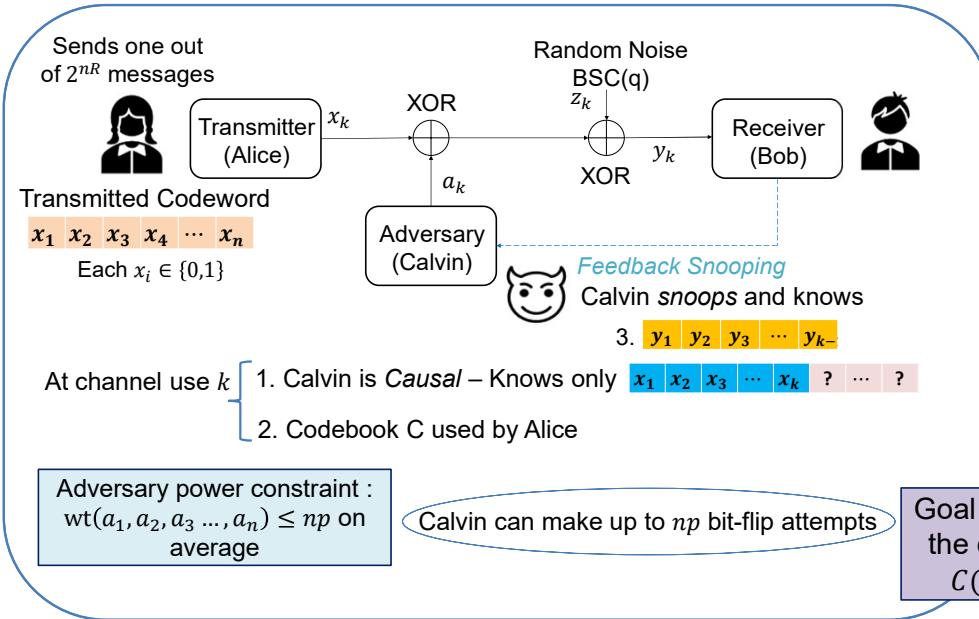


Causal Adversarial Binary Symmetric Channel with Feedback Snooping

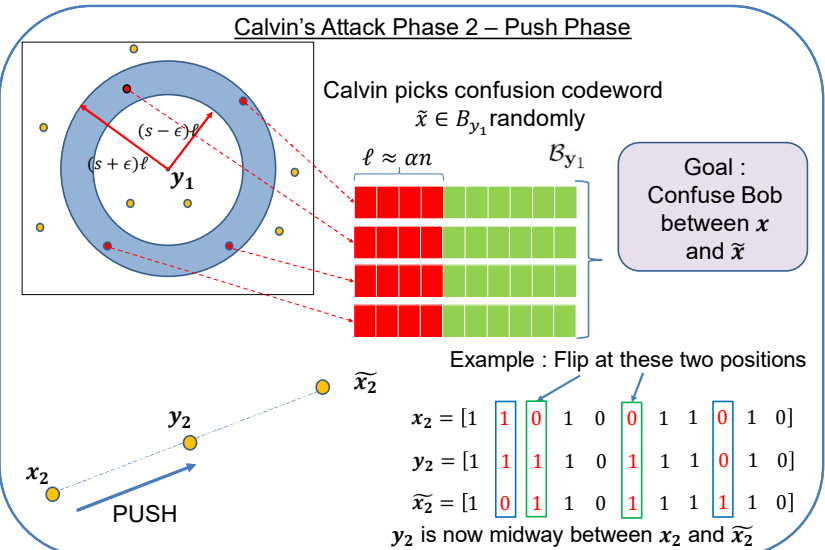
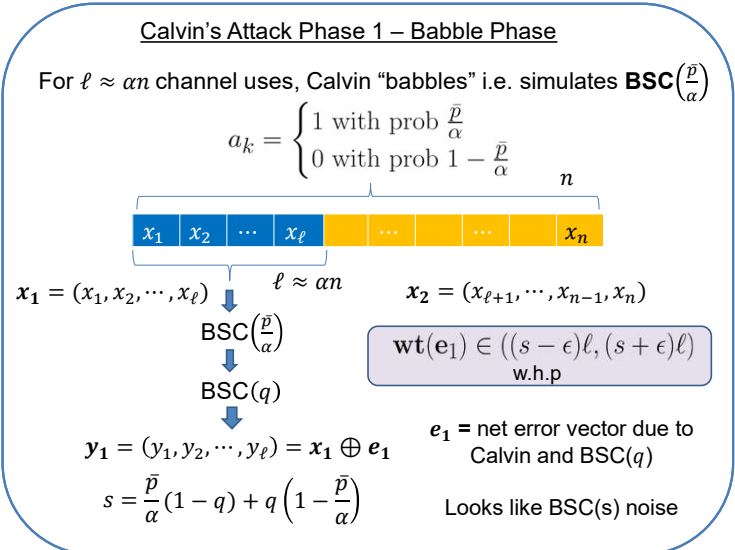
Vinayak Suresh and David J. Love

School of Electrical and Computer Engineering, Purdue University



We show an upper bound $C(p, q) \leq \bar{C}(p, q)$

Channel Capacity = Maximum Rate of Reliable Information Transfer



$$C(p, q) \leq \min_{\bar{p} \in P} \alpha(p, \bar{p}, q) \left(1 - h_2 \left(\frac{\bar{p}}{\alpha} (1 - q) + q \left(1 - \frac{\bar{p}}{\alpha} \right) \right) \right)$$

$$\alpha(p, \bar{p}, q) = 1 - 4(p - \bar{p})$$

$$P = \{\bar{p} : 0 \leq \bar{p} \leq p\}$$

- Fix BSC cross over prob q
- For p below some threshold, $\bar{C}(p, q)$ convex and equals $BSC(p * q)$ capacity
- For p above it, $\bar{C}(p, q)$ tangent to $BSC(p * q)$ capacity
- $\bar{C}(p, q) = 0$ above $p = \frac{1}{4}$

FUTURE WORK

- Investigate if upper bound is achievable
- Consider the case of transmitter with feedback
 - A guess – cut-off point for p moves to $p = \frac{1}{3}$

